INTRODUCTION

This atlas presents data on ground-water quality for the McDermitt 1° x 2° quadrangle. The basic data were compiled as part of the Great Basin Regional Aquifer-Systems Analysis of the U.S. Geological Survey (Harrill and others, 1983).

The data herein were obtained from various sources, including published reports and computerized data files. The computer files accessed for this effort are: (1) WATSTORE, the National Water-Data Storage and Retrieval system maintained by the Water Resources Division of the U.S. Geological Survey; (2) WADS, a system created by the Desert Research Institute, University of Nevada; and (3) RASS, a system maintained by the Geologic Division of the U.S. Geological Survey. Other potential major sources of data are. the National Uranium Resource Evaluation (NURE), a U.S. Department of Energy project; reports of sampling efforts begun in 1980 by the U.S. Bureau of Land Management; and U.S. Geological Survey reports on various hydrographic areas. Only those analyses that pass certain quality-control criteria are included herein. A chemical analysis is excluded if (1) determinations do not exist for all of the principal ions, or (2) the analytical results do not meet the following criterion for electrical balance: total cations and total anions must agree within 10 percent, using the formula:

$$\text{imbalance (in percent)} = \frac{(\text{cations} - \text{anions})}{(\text{cations} + \text{anions})} \times 100 ,$$

where the concentrations are expressed in milliequivalents per liter. This electrical imbalance should be small for comprehensive analyses and it therefore serves as a check on the quality of the analytical results.

Where sample sites are closely spaced, or where more than one analysis is available for a single site, areal averaging is applied to prevent overprinting of information on the map (see side 1). Furthermore, if data for a deep well or for a thermal water are available within an area containing other data (shallow or nonthermal), the other data are not included in the averaging. Finally, if data for both a deep well (1,000 feet or greater) and a thermal water (30 °C or greater) are available, only the deep data are used. The averaging is done over a map area of 0.5 inch by 0.5 inch at a scale of 1:250,000, which is equivalent to about 4 square miles. One consequence of this procedure is that the actual map location corresponding to the sampling site does not necessarily coincide exactly with the computer-plotted location on the map (which is at the center of the 4-square-mile averaging area). Thus, the plotted data for springs may be offset from the spring locations shown on the topograhic base map.

The general chemical character of each water (that is, the relative proportions of principal cations and anions) is shown in the trilinear diagrams (side 1) and indicated by a letter code on the map (see "Explanation"). The characteristics and uses of trilinear diagrams are discussed by Hem (1985, p. 178-180). Both the map and the trilinear diagrams used the same depth-and-temperature symbols. The bar graph (side 1) indicates the relative proportion of major cations and anions for the indicated ranges of dissolved-solids concentration.

REFERENCES CITED

Bliss, J. D., 1983, Nevada--Basic data for thermal springs and wells as recorded in GEOTHERM, part B: U.S. Geological Survey Open-File Report 83-433-B, 707 p.

Cohen, Philip, 1962, Preliminary results of hydrochemical studies in the Humboldt River Valley near Winnemucca, Nevada: Nevada Department of Conservation and Natural Resources, Water Resources Bulletin 19 27 p.

Eakin, T. E., 1962, Ground-water appraisal of Independence Valley, western Elko County, Nevada: Nevada Department of Conservation and Natural Resources, Ground-Water Resources - Reconnaissance Report 8, 31 p.

Flynn, T., 1981, Paradise Valley, in Trexler, D. T., Koenig, B. A., Flynn, Thomas, Bruce, J. L., and Ghusn, George, Jr., Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies: Nevada Bureau of Mines and Geology Report DOE/NV/10039-3, p. 186-190.

Ghusn, George, Jr., 1981, Statewide assessment, in Trexler, D. T., Koenig, B. A., Flynn, Thomas, Bruce, J. L., and Ghusn, George, Jr., Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies: Nevada Bureau of Mines and Geology Report DOE/NV/10039-3, p. 191-196.

Harrill, J. R., and Moore, D. O., 1970, Effects of ground-water development on the water regimen of Paradise Valley, Humboldt County, Nevada, 1948-68, and hydrologic reconnaissance of the tributary areas: Nevada Division of Water Resources, Bulletin 39, 123 p.

Harrill, J. R., Welch, A. H., Prudic, D. E., Thomas, J. M., Carman, R. L., Plume, R. W., Gates, J. S., and Mason, J. L., 1983, Aquifer systems in the Great Basin Region of Nevada, Utah, and adjacent states--a study plan: U.S. Geological Survey Open-File Report 82-445, 49 p.

Hem, J. D., 1985, Study and interpretation of the chemical characteristics of natural water (3d ed.): U.S. Geological Survey Water-Supply Paper 2254, 263 p.

Mariner, R. H., Rapp, J. B., Willey, L. M., and Presser, T. S., 1974, The chemical composition and estimated minimum thermal reservoir temperatures of the principal hot springs of nothern and central Nevada: U.S. Geological Survey open-file report, 32 p.

CONVERSION FACTORS AND ABBREVIATIONS

"Inch-pound" units of measure used in this report may be converted to International System (metric) units by using the following factors:

Multiply	*By*	*To obtain*
Feet (ft)	0.3048	Meters (m)
Inch (in.)	25.40	Millimeters (mm)
Square miles (mi^2)	2.590	Square kilometers (km^2)

For temperature, degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) by using the formula °F = [(1.8)(°C)] + 32.

Site designation	Latitude, longitude (deg-min-sec)[1]		Type of site	Temperature (degrees Celsius)	pH (units)	Specific conductance (microsiemens per centimeter at 25°C)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Silica (mg/L)	Dissolved solids[2] (mg/L)	Cation-anion balance[3]	Sampling date (year-month-day)	Well depth (feet)	Source of data[4]
NOT SPECIFIED	410015	1173231	Well	16	8.3	1,250	100	17	140	5.0	300	5	210	130	0.4	53	800	-2	61-07-31	--	Cohen, 1962
NOT SPECIFIED	410042	1171958	Well	11	8.1	5,980	58	36	1,200	10	520	0	570	1,300	2.8	37	3,500	1	61-11-27	--	Cohen, 1962
NOT SPECIFIED	410122	1173131	Well	--	8.4	1,340	46	12	250	10	450	14	150	120	0.8	41	870	0	61-07-31	--	Cohen, 1962
NOT SPECIFIED	410130	1173439	Well	--	8.2	638	37	7.7	80	2.1	150	0	67	82	0.6	42	390	-1	61-07-31	--	Cohen, 1962
NOT SPECIFIED	410149	1173706	Well	15	7.8	1,020	47	17	160	12	380	0	93	92	0.8	42	650	1	61-07-29	--	Cohen, 1962
NOT SPECIFIED	410221	1173433	Well	--	8.4	765	66	17	72	8.4	330	11	65	40	0.6	51	490	-1	61-08-01	--	Cohen, 1962
NOT SPECIFIED	410235	1174043	Well	12	8.1	1,100	40	14	180	8.0	370	0	110	100	0.7	14	660	0	61-12-28	--	Cohen, 1962
NOT SPECIFIED	410254	1173714	Well	--	8.3	1,060	57	28	130	34	420	8	110	75	0.8	55	700	0	61-08-01	--	Cohen, 1962
HOT SPRINGS RANCH SPS	410409	1170439	Spring	25	7.4	350	19	3.1	72	5.0	190	0	27	19	6.2	33	270	3	--	--	Ghusn, 1981
ARTESIAN WELL	410622	1173415	Well	68	7.5	--	26	7.8	430	23	1,170	0	68	14	3.2	24	1,200	1	--	--	Flynn, 1981
NOT SPECIFIED	410828	1173454	Well	--	8.0	703	56	9.8	72	11	160	0	91	79	0.4	81	480	2	61-11-14	--	Cohen, 1962
DUTCH FLAT WELL	410911	1173356	Well	13	7.7	--	54	15	380	20	620	0	200	230	0.6	36	1,200	0	--	--	Flynn, 1981
W.S. HILL WELL	410956	1173533	Well	13	8.0	--	14	8.0	180	5.7	180	0	170	95	0.5	67	630	1	--	--	Flynn, 1981
NO NAME WELL	411036	1173458	Well	17	8.2	--	27	4.0	40	8.7	160	0	23	21	0.4	73	280	-1	--	--	Flynn, 1981
NOT SPECIFIED	411751	1161315	Spring	--	8.1	1,450	240	43	44	16	270	0	640	14	0.5	34	1,200	-1	56-06-27	--	Eakin, 1962
PARADISE WELL	411827	1174118	Well	18	7.2	--	96	20	66	3.0	270	0	110	67	0.3	16	510	4	--	--	Flynn, 1981
HOME RANCH WELL	412017	1173057	Well	18	7.1	--	50	14	63	13	280	0	37	36	0.7	38	390	2	--	--	Flynn, 1981
E.W. GONDRA WELL	412456	1172648	Well	22	8.4	510	23	6.0	57	13	170	0	31	29	0.7	83	330	2	--	--	Flynn, 1981
DAY WARM SPRINGS	412459	1172233	Spring	36	6.8	--	29	7.1	460	21	1,380	0	17	18	5.7	16	1,200	-2	--	--	Flynn, 1981
KLAMMAN WELL	412513	1172548	Well	18	6.9	--	19	4.1	60	10	170	0	28	24	0.5	47	270	1	--	--	Flynn, 1981
THE HOT SPRINGS	412521	1172311	Spring	58	8.0	1,340	10	8.0	300	36	880	0	36	26	-	55	900	-3	--	--	Mariner and others, 1974
BUCKBRUSH SPRING	412618	1172159	Spring	9.0	7.6	--	43	16	71	9.0	240	0	43	42	0.6	33	380	6	65-06-03	--	Flynn, 1981
HOT SULFUR SPRINGS	412806	1160858	Spring	90	7.0	1,760	49	13	390	41	1,180	0	18	40	7.2	84	1 200	2	--	--	Mariner and others, 1974
NOT SPECIFIED	413112	1173251	Well	--	--	420	24	7.0	38	4.5	120	0	25	38	0.5	44	240	0	68-07-18	--	Harrill and Moore, 1970
PASQUALE-RICH WELL	413132	1173230	Well	--	--	--	27	7.0	38	4.5	120	0	25	38	0.5	44	240	2	65-06-03	--	Flynn, 1981
CORDERO MERCURY MINE (S. UPPER)	415448	1174848	Well	56	8.1	589	3.6	0.2	120	2.4	200	0	59	26	13	60	400	2	57-05-17	--	Bliss, 1983
FORT MCDERMITT WELL	415628	1174142	Well	21	--	210	13	2.8	21	8.7	79	0	13	13	0.2	69	180	2	76-09-30	715	WATSTORE
MENTABERRYS WELL 2	415642	1174604	Well	26	--	--	7.7	1.0	88	3.2	180	0	49	19	5.3	56	310	-2	76-04-23	270	WATSTORE
NOQUE'S NEVADA WELL	415719	1174251	Well	34	--	323	5.8	0.2	58	12	120	0	26	14	2.6	110	280	4	76-06-16	701	WATSTORE
VIC ALBISU WELL	415920	1174302	Well	22	--	384	24	3.0	48	8.0	130	0	39	22	1.1	77	280	2	76-05-27	600	WATSTORE

[1] Data are listed in order of increasing latitude and, for identical latitudes, increasing longitude.

[2] Computed sum (with bicarbonate multiplied by 0.492 to make results comparable with residue-on-evaporation values).

[3] Computed as described in introductory text. Negative value indicates that anions exceed cations.

[4] WATSTORE is U.S. Geological Survey's National Water Data Storage and Retrieval System. Citations for other sources are listed under "References Cited."